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ABSTRACT

Today's postindustrial or information age requires a different mix and a more advanced level of basic employability skills than those needed in the industrial age. As a result, the workplace is now demanding a higher entrance level of employability skills than the schools have previously been asked to provide. In addition, information technology is increasingly developed in the workplace. Employers have responded by complaining about the schools, helping the schools, and starting in-house programs to provide basic employability skills and further training. A literature review revealed that little is known about private sector training, particularly about employer-provided training and most specifically about informal, on-the-job training. Estimates of employers' annual expenditures on training are of questionable accuracy. Private sector training may be of sufficient policy importance to warrant a systematic data collection effort. The findings of the literature review also confirm that women and minority groups are much less likely to receive employer-provided training than are white males. Suggested policy changes may improve access to private sector training. Finally, the review suggests that the popular idea that firms underinvest in human capital may not be accurate. It suggests that more research is needed, but to the extent that underinvestment in private sector training does exist, options are possible for increasing the extent of such training. (70 references) (KC)

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7b. EVIDENCE ON PRIVATE SECTOR TRAINING

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7b. EVIDENCE ON PRIVATE SECTOR TRAINING

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Hundreds of billions of dollars are spent annually in the United States on education and training by individuals, private companies, non-profit organizations, and governmental entities. That these sizeable expenditures exist and persist over time is prima facie evidence that the perceived benefits derived from the expenditures exceed the associated costs. The benefits to these expenditures accrue at multiple levels: to individuals in the form of enhanced earnings, greater employment stability, increased mobility and choice, greater occupational prestige, etc.; and to organizations in terms of enhanced competence, greater flexibility, increased competitiveness, and so forth. On a more grand scale, the quality of a nation's labor force is vital to its rate of economic growth and its progress toward economic development (Denison, 1974; Denison, 1979). This is always true, but it becomes imperative as a nation moves from an industrial age and into a post industrial or information age. This progression is visualized in Figure 1 (Mangum, Mangum and Kim, 1988).

Industrialization generally begins when productivity in the primary extractive activities of agriculture, fishing, and forestry rises above the subsistence level, freeing resources for manufacturing activities. Mining as an extractive industry is often a handmaiden of manufacturing. Manufacturing begins with simple products from simple production processes that are labor intensive and doable by unskilled labor. The products typically serve accessible domestic markets, often displacing

previously homemade or imported goods. Basic electronic assembly, farmed out from developed countries in order to tap the cheaper labor of less developed countries, frequently joins textiles, clothing and shoes as characteristic of this early stage of industrial development. Upon meeting domestic need, export of labor intensive products to nations with higher labor costs or to nations still at the extractive stage of development helps finance necessary imports.

Early industrial development yields profits and wages above that possible in the extractive stage. The use of machinery becomes the key to further increases in both profits and wages. The natural step is into more capital intensive industries that process available natural resources into intermediate products. This step requires increased skills, primarily semiskilled labor. Intermediate products then become the raw materials for producing machinery and equipment for manufacturing, transportation, and communication as well as for basic consumer products.

The next way station is complex assembly. Household appliances, machine tools, consumer electronics, and automobiles characterize this stage. Capital intensiveness rises but so does the skill requirement. Volume production requires marketing and distribution systems that in turn create expanding forms of employment. Beyond complex assembly lies an emerging stage of exotic processes such as precision castings and genetic engineering contributing to the production of such items as specialty steels, fine ceramics, fiber optic cable, sophisticated lasers, integrated circuits, advanced aircraft engines, artificial human

organs, and who knows what. This is a stage to which relatively few countries have thus far matured.

Progression through the stages of economic development is motivated from the front by a reaching out for greater profits, higher wages, and better living conditions. Nations on lower steps of the staircase try to advance by competing with that which they have available; often cheap labor. A nation can continue to compete where it is, or try to move up the staircase through a combination of more physical or human capital per worker. Apparent in this progression is that technological advance tends over time to reduce the relative importance, first of natural resources, and then of physical capital resources, and to continually elevate the importance of human resources. Each stage in the advance is built upon those that went before. Natural and capital resources are always necessary--they never become unimportant--but human resources become increasingly critical.

Technology is frequently thought of in terms of machines. This is both unfortunate and incorrect. Technology is knowledge, skills and ideas embedded in machines, in institutions and in systems (Marshall, 1988). Technology is the product and result of human innovation, human imagination, and human effort. In the emerging information age the relevant technology is composed of thinking skills: the abilities to communicate, to analyze data, to function in groups, to problem solve, to critically evaluate, to learn, and the flexibility to endure and produce change.

As economic growth becomes more dependent on the rate of human resource development, economic policy must increasingly be coordinated

with (and focus upon) human resource policy in order to be effective. Because of their nature, the acquisition of these higher order thinking skills requires the involvement of both school based and workplace based learning. While the focus of this paper is the exploration of specific issues related to private sector skill development, this focus is best obtained in the context of a brief review of the institutions that compose our system of human resource development.

I. The American Education and Training System

The American education and training system is composed of a diversity of institutional providers and instructional settings. Description of the system (enrollments, funding levels and other characteristics) is challenging due to the multiplicity of funding sources, overlapping constituencies, and the extensive inter-relationships across institutions which make clear delineation of where one institutional provider begins and another ends difficult to assess.

One way of adding some clarity to the institutional picture is to view the providers of employability and skill development along the dimensions of age and "ability" (Figure 2). These descriptors, particularly that of ability, are introduced solely for pedagogical purposes and are not to be interpreted narrowly. While Figure 2 involves a large amount of simplification and certainly does not include all institutional sources of employability development, it does visually demonstrate the diversity of institutions in the American education and training system.

Employability and skill development begin in the home with the interaction of parents, siblings and extended family. These life experiences are supplemented by neighbors, friends, and community. Public and private elementary and secondary schools are fundamental to the development of employability skills from childhood to young adulthood. Part time, summer, and intermittent employment while still in school also provide important learning experiences.

Of the approximate 75 percent who complete a high school education, three in five enter a college or university, and about one half of those that enter graduate (Levitan, et al., 1986). Some continue to further university training at the post-graduate or professional degree level. Those not exposed to college education for qualifying training may emerge directly into the workforce for on the job preparation or may potentially be served by a variety of institutions including: technical institutes, non-collegiate vocational schools, proprietary schools, apprenticeship, the military, and federal employment and training programs such as those authorized under the Job Training Partnership Act (JTPA). A sense of the magnitude of the education and training system, both in terms of expenditures and enrollments, is given in Table 1. Drawn from multiple sources, the figures cited undoubtedly both overlap and leave some gaps. While these figures should not be regarded as definitive statements of expenditure and enrollment levels, they do indicate the vastness of American education and training activities.

Beyond those institutions whose major function is the provision of employability and job skills lies a world in which occupational skill development is mixed with or motivated more directly by production

activity. This is the realm of employer provided training which is "by almost any definition, no less a segment of the nation's education system than our colleges, universities, technical institutes,..." (Schwaller, 1980). Employer provided training constitutes a complex array of training options with skill development occurring in a variety of formats: informal on the job training, structured on the job training, in-plant classroom based training, external classroom training, and so forth (Mangum, 1984; Mangum and Mangum, 1985).

While there are significant flows of people and dollars between employers and institutions of skill development as organizations, workers, and government invest in qualifying and upgrading training, these flows are frequently difficult to quantify. In the case of on the job training, training is co-produced with the output of good or service. It becomes problematic to discern the distribution of expended time, equipment, and financial capital between the joint activities of training and production. Informal training (learning by watching others, casually sharing insights as to "easier ways," responding to supervisor suggestions, etc.) is even more difficult to assess. A later section of this paper will indicate that existing estimates of the volume and dollar value of such training are suspect.

Figure 2 suggests a number of points that should be underscored. First, as already mentioned, is the diversity of institutions involved in employability and skill development in the American system. A second point is the distinction between the mainstream system and the system of largely government sponsored remedial education and training efforts referred to in the figure as the "second chance" system.

A third point is recognition of the variety of institutions involved in providing services to those who do not attend college after completing high school or those that fail to complete high school. These individuals have been referred to elsewhere as the nation's "forgotten half" (William T. Grant Commission, 1988), those likely to miss out on what the Commission calls "the striking correlation between educational attainment and employment and earnings." Their numbers and the barriers they face are alarming. For example, the Bureau of Census estimates that some 13 percent of Americans are functionally illiterate, including 6 percent of high school graduates. Nearly 14 percent of the nation's 18 to 21 year-olds have left school prior to high school graduation (Bureau of Census, 1986).

A fourth and final point suggested by Figure 1 is the need to view employability and skill development from the perspective of a lifelong process. Whether labeled lifelong learning, career education or something else; or viewed from an individual, employer, or public policy viewpoint; employability and skill development is a process of becoming rather than a state of being.

II. What is Private Sector Training?

A first task in exploring private sector training is to identify, from within the broad array of institutions mentioned above, those providers that constitute the world of private sector training. On the surface, the most reasonable distinction would appear to be between employer-provided and non-employer provided training. However, problems arise with such a division.

One problem is delineation between the provider of the training and the entity paying for the training. For example, much of the training that employers pay for is in the form of services purchased from other entities, including public and private vocational schools, proprietary schools, community colleges, consulting firms, and the like. As a result, descriptions of the extent of private sector training can vary widely by whether the description is made on the basis of the provider of or the payer for the training. Further, for many non-employer training providers, tuitions do not constitute the full cost of training as training services are subsidized to varying degrees by tax dollars. Consequently, estimates of the dollar amount of employer purchased training may be misleading.

An additional problem in defining private sector training using the simple distinction between employer-provided and non-employer provided training is that many non-employer training providers are private entities. For example, approximately 76 percent of the noncollegiate postsecondary schools in the United States are proprietary schools while another 13 percent are non-public but operated on a not for profit basis (National Center for Education Statistics, 1988). These are all in the private sector as are the private colleges and universities which service a nontrivial percentage of all students at that level. Apprenticeship training is another example of this difficulty. Whereas apprenticeship training in many countries is an integral part of the government supported education system, American apprenticeship programs are predominantly industry based and operate on significant amounts of private funding from employers, unions, individual workers, or

combinations of the three. Approximately 85 percent of apprenticeship programs in the United States are sponsored unilaterally by employers, 1 percent by groups of employers, and 15 percent by joint union-employer agreement (the largest in total number of apprentices trained) (Glover, 1980). American apprenticeship receives sizeable tax support however in that much of the "related instruction" component of apprenticeship is financed by vocational education funds allocated under the Carl Perkins Vocational Education Act.

The key point of this discussion is that the available literature has not narrowed in on an accepted definition of what constitutes private sector training and that there are good reasons for this dilemma of definition. One example may underline this point. One of the most thorough studies in this field to date is titled, "Private Sector Training: Who Gets It and What Are Its Effects?" (Lillard and Tan, 1986). Yet, on its first page the report proposes to "draw a broad picture of post school training in the United States". Private sector and post-school training seem to be used interchangeably in this and other cases, but not in all cases. These questions of definition become important as one seeks to compare alternative estimates of the volume of private sector training, its dollar value and its impact on individuals and society. In the following section, estimates are provided of the training expenditures of employer training isolated from the expenditures of other institutions providing training.

III. How Much is Spent on Private Sector Training?, How Much is Provided?, and Who Provides the Training?

Estimates of employer expenditures on training are few in number and vary widely in their magnitude. Isolating expenditures on employer-provided training is made difficult because of data limitations and the fact that much of the training paid for by employers is delivered by other entities. Further, many estimates of employer-provided training do not include costs such as the wage costs of trainees or supervisory personnel who serve as trainers, nor costs of increased equipment depreciation or increased output wastage due to training. Determination of the total dollar value of both employer-provided and total private sector training is complicated as a result.

Dollar Estimates on Private Training

The American Society for Training and Development (ASTD) estimates that in 1984 employers spent approximately $30 billion in direct costs for formal training that they either provided themselves or purchased from outside suppliers of training and that costs of employer-provided informal training range from $90 to $180 billion annually (Carnevale, 1986). Extrapolating from Dun and Bradstreet data, the magazine Training estimates that in 1986 U.S. firms with 50 or more employees budgeted some $32 billion to provide 1.2 billion hours of formal training to 38.8 million employees (Lee, 1987). Miller suggests that approximately $25 billion of the annual total spent on training by firms is spent on young workers at the entry level (Miller, 1988). While these figures are frequently cited, the calculations behind the

estimates is uncertain. Other estimates made by extrapolating from the Survey of Participation in Adult Education or private surveys have produced significantly lower figures. For example, estimates based on a Conference Board survey of large employers plus extrapolations for small businesses yielded an employer training expenditure figure of $12 billion for 1984 (Lusterman, 1985). These estimates, 12 to 30 billion dollars in 1984, seem to define the range of reasonable estimates of employer based formal training.

Decomposing formal training expenditures by employers, Carnevale and Goldstein (1985) suggest that employers provide about 69 percent of their formal training in house and purchase approximately 31 percent of their formal training from outside providers. ASTD estimates that approximately 64 percent of purchased employer-provided training is purchased from schools while 36 percent is purchased from non-school entities (Table 2).

ASTD data maintain that the average training expenditure of firms is about 1 percent of payroll, but that training intensive firms frequently have training expenditures in the range of 3 to 4 percent of payroll (Carnevale and Gainer, 1988). A Bureau of National Affairs' Personnel Policy Forum survey of some 140 firms in 1984 reported median formal training costs per employee of $122 to $250 but the finding is based on a response rate of about 7 percent. A recent survey of firms by Delaney sets 1986 training expenditures at $350 to $1400 per employee but the overabundance of large firms in the respondent sample raise concerns about its representativeness (Delaney, et al., 1988).

Estimates from ASTD suggest that employers provided some 17.6 million formal courses to almost 15 million trainees in 1985 (Carnevale, 1986).

Significant amounts of training are purchased directly by adult workers according to analysis of the Survey of Participation in Adult Education (U.S. Census Bureau, 1987). In this supplement to the Current Population Survey, workers are asked if they received any training. If the respondent indicates they received training, they are asked who paid for the training. Expenditure data is collected on training paid for by the respondent or by family. Conceptually these data should not include training paid for by an employer or governmental unit, but it is unclear whether this is the case. For example, it is not clear how a respondent might treat training expenditures for which employer provided reimbursement was later received.

According to this source (Table 3), over 56 percent of worker purchased training is from schools, representing a 1985 annual dollar value of approximately $5.2 billion. About 55 percent of school supplied training is provided by colleges and universities, 27.5 percent by community colleges and technical institutes, 12.5 percent by vocational schools and 5 percent by elementary and secondary and other schools. Beyond school provided training, approximately 14.2 percent of purchased training is provided by professional, trade and labor organizations, 15.7 percent by the training industry, 3.2 percent by community organizations, 5.6 percent by government, and 4.7 percent by tutors, private instructors, and other providers.

There is some disagreement in the estimates of employer involvement in paying for school based training. Bishop, et al. (1985) find that

employers pay for almost 19 percent of school based training. Carney (1985) finds that among Americans using education institutions to qualify for jobs, 8 percent had courses paid for by employers while in the case of upgrading training, employers paid for 41 percent of the courses.

The Extent of Private Sector Training

In the supplement to the January 1983 Current Population Survey, workers were asked a series of questions built around the following two basic questions: "Did you need specific skills or training to obtain your current (last) job?" and "Since you obtained your present job, did you take any training to improve your skills?" (Carey, 1985). Approximately 55 percent (53.9 million) of the workers employed in January of 1983 (97.3 million) reported needing specific training to qualify for their current jobs, while 35 percent reported the taking of training to improve their job skills once hired. Table 4 summarizes some of the findings of this study.

School programs and informal on the job training were identified by the respondents as the major sources of qualifying training received. Of the 28 million workers receiving their qualifying training in schools, about 8 percent attended training sponsored by employers and 3 percent took school based training sponsored by government. In contrast, nearly 5 percent of the 9.4 million workers receiving qualifying training in formal company training programs obtained this training in government sponsored company programs.

Of the approximately 34 million individuals reporting skill upgrading training on their current job, 40 percent received some training through informal on the job training. Schools and formal company training programs were also important sources for skill upgrade training. Of school based upgrading training, 41 percent was sponsored by employers and 3 percent by government.

Carey's findings that about 10 percent of all workers received formal qualifying or upgrading training from their employer is confirmed in other studies (Haber (1988), Lillard and Tan (1985), and Hollenbeck and Willke (1985)). Lillard and Tan report an estimate of 12 percent, while Hollenbeck and Willke estimate 11 percent. Both studies employ the same data set as Carey, the 1983 CPS. Haber, using the Survey of Income and Program Participation, reports 8 percent of all workers receiving formal training from their current employer. Estimates of the extent of informal on the job training as a source of qualifying and upgrading training across these studies varies more dramatically. While the Lillard and Tan estimate that 15 percent of workers received training from informal OJT and the Hollenbeck and Willke estimate of 14 percent are consistent with the Carey estimate of 14 percent for upgrade training, neither of these sources distinguish between qualifying and upgrading training and consequently, neither documents the Carey result that 28 percent of all employed workers report informal OJT as a source of the training needed to qualify for their job.

Variations in Employer Training by Industry

Data from the Survey of Participation in Adult Education indicate significant variation in employer based formal training by industry (Carnevale and Gainer, 1988). Such training is disproportionately present in industries with high concentrations of managers, professionals and technicians. In terms of training intensity (courses per employee), the mining, non-electrical machinery manufacturing, communications, utilities, hospitals, and banking sectors are high in formal employer based training. Using more narrow industry classifications, Bishop, et al. (1985) find financial services, wholesale trade, and manufacturing to offer the greatest amount of training.

Drawing on data from the Survey of Participation in Adult Education and other sources, The American Society of Training and Development has estimated training expenditures across various industries for 1984. On a per employee basis, ASTD estimates average per employee expenditures of $283, with above average expenditures in industries such as public administration ($645), mining ($566), and finance ($529); with below average expenditures in agriculture production ($54), construction ($127) and trade ($136). In total 1984 training expenditures, ASTD estimates expenditures to have been highest in services ($8700 million), manufacturing ($6450 million) and durable goods ($4710 million); and lowest in agriculture ($90 million), mining ($720 million) and construction ($720 million) (Carnevale, 1986).

Variations By Employer Size

There is considerable evidence of differences in training expenditures and practices by size of firm. Large employers provide more training than do smaller employers (Barron, Black and Loewenstein, 1987). Data from the Small Business Administration suggest that the relative importance of employer based training increases with firm size and that large employers are more likely to be the source of job specific training used by employees than are small employers (U.S. Small Business Administration, 1988; also see Haber, 1988; Bishop, 1982; Simpson, 1984). These data show that approximately 75 percent of employees who receive training in firms of fewer than 100 employees receive their training off the job, compared to 58 percent of employees receiving training in larger firms. Bishop et al. (1985) present evidence suggesting that comparisons of large versus small firms mask some variation. They find that investment in training is larger at both ends of the spectrum, with large firms of 200 or more employees and small firms of under 10 employees both devoting more time to training than medium size firms.

Consistent with this literature is evidence that larger firms are more likely to pay for training taken outside the firm than are smaller companies. Carnevale and Gainer suggest that employers with less than 100 employees pay for about 23 percent of training taken outside the firm while larger firms average 32 percent (Also see Haber, 1988). Large companies are more likely to conduct formal in house training programs than are smaller companies (Bureau of National Affairs, 1985). The proportion of employer based training purchased from outside

providers appears to vary across firm size as well. Carnevale and Gainer (1988, p. 41) state that large companies buy approximately 40 percent of their formal training from outside providers and that the percentage of outside purchase increases as the size of the firm decreases. However, large firms make more extensive use of training consultants than do small firms, particularly in developing training programs. Similarly, larger firms make greater use of commercial training packages than do small firms (Bureau of National Affairs, 1985, p. 24).

IV. Who Receives Private Sector Training?

In 1986 males, comprised 55.5 percent of the workforce, but received 53.3 percent of the formal employer based training provided in the country. Perhaps because of being overrepresented among new entrants, women received 46.6 percent of such training while comprising 44.4 percent of the workforce. Minorities were disproportionately underrepresented in the receipt of such training. While blacks and hispanics comprised 9.5 percent and 5.5 percent of the workforce respectively, they received 5.1 percent and 2.7 percent of formal employer based training, reflecting in part the low level jobs to which they seem to have access. By age of training recipients, 67.6 percent of formal employer based training was provided to those workers between the ages of 25 and 44, and 82.4 percent to those between 25 and 54 years of age (U.S. Census Bureau, 1987).

To explore factors influencing the likelihood of participation in post-mandatory schooling forms of skill development, a number of studies

have employed data sets with detailed information on individual respondents. These studies typically indicate significant differences in post school training participation by race and sex. Adams et al. (1987), using a sample from the NLS Young Mens cohort, look at training participation at two points in the lifecycle and find black males to be significantly less likely to participate in training than white males. Lynch (1988), using data from the NLS Youth cohort, separates the post school training data into three types: 1. on the job (company) training; 2. training received outside the firm from business, vocational and technical schools, nursing programs, barber schools, and correspondence courses; and 3. apprenticeships. Estimating the probability of participation in each of the three settings, she finds off the job training to be the major source of the training received and women and nonwhites to have a significantly lower probability of receiving on the job training than do white men. These results are supported elsewhere for nonwhites, but are occasionally questioned for women (Lillard and Tan, 1986; Rumsberger, 1984; Flanagan, 1974). In Lynch's work, participation in company training is found to be concentrated among white, married, and unionized males with significant years of work experience (See Delaney, et al., 1988 and Lillard and Tan, 1986 for further support of the union effect mentioned here). The probability of receiving off the job training is lower for males than females and decreases with work experience (Lynch, 1988; Lillard and Tan, 1986).

Racial differences appear in training participation by occupational type of training as well as by institutional source. For example,

nonwhite males are frequently found to be less likely to participate in managerial or professional/technical training than are their white counterparts (Lillard and Tan, 1986; Adams et al., 1987).

Among the factors influencing the likelihood of receiving post school occupational training, formal educational attainment stands out in the literature as of major importance. Lillard and Tan (1986) find that the probability of receiving occupational training in either an off the job or on the job setting increases with formal schooling. They find that individuals with two years of post school formal education are 20 percent more likely to get training on the job than are those with only a high school education. Further, college graduates are 50 percent more likely to receive such training than are high school graduates and individuals with more than 16 years of formal schooling are 30 percent more likely to receive on the job training than are those with baccalaureate degrees. Adams, et al. (1987) find formal educational attainment to be a much stronger predictor of subsequent participation in post school occupational training for black males than for whites while Lillard and Tan find schooling effects to be smaller for women than for men.

Geographical region and proxies for local and national economic conditions are among the other variables most frequently identified as affecting participation decisions. Adams et al. (1987) conclude that residence in metropolitan areas and residence in the non-South as opposed to the South are associated with a higher likelihood of training participation. In Lillard and Tan (1986), training participation is lower in the South, higher in the West, and training outside the firm is

more likely in years of high national unemployment. Interestingly, the likelihood of company training for members of the NLS Young Men's cohort falls with rising national unemployment rates but increases for members of the NLS (mature) Men's and Women's cohorts. This suggests significant amounts of upgrade training during slack economic conditions.

The amount of training an individual receives appears to vary widely by occupation. A number of surveys, often using data from large private companies such as the Fortune 500 list, have explored the occupational incidence of private sector training. Table 5 summarizes some findings from two of these studies. In these studies, investment on a training dollar per employee basis is frequently highest in executive training--in one study absorbing 12 percent of the training budget while executives comprised only .75 percent of the total employees on average (Stephan et al.). Another recent survey of 495 U.S. business units found training expenditures per employee to be higher for managers, professionals, and technical workers than for clerical, manufacturing or production workers (Delaney, et al., 1988). Sales personnel typically receive the greatest number of annual hours of formal training according to most of these surveys (Lee, 1987).

The institutional source of training also appears to vary by occupation and by whether the training is for skill qualification as opposed to skill upgrading. The most complete explorations of these issues come from data in a supplement of the 1983 Current Population Survey (Carey, 1985). The data suggest significant differences in the amount of both qualifying and upgrading training across occupations. Both qualifying and upgrading training were most prevalent among

professional, technical, and managerial workers. Qualifying and upgrading training were least common among laborers, service workers, and transportation workers. Informal on the job training was the most common source of qualifying training in 10 of 15 occupational groups (professionals (technical and nontechnical), technicians, managers and clerical personnel being the exceptions) and for upgrading training in 11 of 15 occupational groups (clerical personnel being the one change). Workers in the repair, craft and precision production occupations were more likely to acquire qualifying training in formal company programs than were those in any other occupational classifications. Be it qualifying or upgrading training, managerial workers were more likely to receive their training from employers than were professional or technical workers. This is consistent with the characterization of managerial training as being more firm specific in nature than either professional or technical skills (See Lillard and Tan, 1986, p. 34).

In summary, minorities are significantly less likely to receive post-school forms of education and training than are white males. These differences have held up even when controls for selection bias have been introduced in the analysis. The literature is more mixed on the issue of gender differences in training participation, with women apparently more likely than men to receive training from non-employer sources, but less likely to receive on the job training (particularly informal OJT). Differences in participation rates by race and sex appear most pronounced in company provided training (when training is proxied by institutional provider) and in professional and managerial training

(when training is proxied by occupational type). These are the types of training often cited as offering the highest rates of return.

Further, the likelihood of receiving post school training rises with the level of formal educational attainment. This is particularly true for blacks. The literature suggests that those acquiring skills early in the lifecycle in formal settings are more likely to have access to additional training later in the lifecycle.

V. What is the Impact of Private Sector Training on Wages and Wage Growth?

There is more agreement than disagreement among studies investigating the returns to post high school occupational training. These studies have used data from a variety of data sources including: the Current Population Survey, the Panel Study on Income Dynamics, the Employment Opportunities Pilot Projects Surveys, and different cohorts of the National Longitudinal Studies of Labor Market Experience. As inferred earlier, clearly distinguishing private from non private sector training in these studies is often difficult.

Among providers of post high school occupational training, company provided training is consistently identified as producing the greatest wage or earnings effect relative to individuals in the samples who did not participate in any formal postschool training. These wage and earnings impacts have been documented to be in the range of 10 to 30 percent depending on the data base used, the controls employed and the dependent variable of analysis (Bishop, 1982; Bishop, et al., 1985; Lillard and Tan, 1986; Mangum and Adams, 1987; Rumsberger, 1984).

Lillard and Tan find a 27 percent wage effect associated with company training in CPS data and a 16 percent earnings effect using NLS-Young Mens cohort data. They use the richness of the NLS to estimate the duration of the training effect and find the average company training effect to persist over 13 years. Barron et al. (1989), using a uniquely detailed data set, are able to document on the job training in several forms (formal OJT, informal OJT with supervisors, informal OJT with coworkers, learning by watching, etc) across a sizeable number of firms. They find that, on average, a 10 percent increase in the amount of OJT received raises wage growth by 1.5 percent. In several studies, completion of company provided training is associated with enhanced occupational prestige and a lower probability of unemployment than that experienced by members of comparison groups (see Mangum and Adams for an example).

Results have been somewhat more mixed for other training providers (Bishop, et al., 1985). Findings on nondegree training from academic institutions has shown earnings differentials of 0 to 8 percent with a duration of positive earnings effects of about 8 years (Lillard and Tan, 1986). Results for correspondence schools has been equally mixed, with positive returns more frequently recorded when hourly wage is used as a dependent variable rather than annual earnings (Mangum and Adams, 1987). Participation in training provided by business and technical institutes has resulted in earnings effects in the 8 to 12 percent range, with positive impacts enduring over approximately a 10 year horizon (Lillard and Tan, 1986; Freeman, 1974; Mangum and Adams, 1987). Informal on the

job training has been associated with wage effects in the 0 to 5 percent range (Lillard and Tan, 1986).

Lynch (1988) collapses the available training data somewhat differently than most other studies, distinguishing between apprenticeship, on the job company training and off the job training and between training received from the current employer as opposed to training received prior to the current employer. She finds that prior participation in apprenticeship or off the job training positively influence wage rates with the current employer, but that prior on the job training is not on average portable for the workers in her sample. Further, she finds weeks of apprenticeship training (and on the job training) with the current employer to carry positive wage effects while off the job training has no significant impact on wages with the current employer.

Proxying training by the occupational area in which training is received, the literature suggests earnings impacts in the 14 to 20 percent range for participants in professional, technical, or managerial training in comparison to similar individuals not participating in training (Lillard and Tan, 1986; Rumsberger, 1984; Mangum and Adams, 1987). Skilled manual training typically carries a 5 to 9 percent rate of return (Lillard and Tan, 1986), while the returns to clerical training often appear as a lower probability of experiencing unemployment or a higher level of occupational prestige, rather than significantly higher wage rates (Mangum and Adams, 1987). While professional, technical, and managerial training are also typically associated with higher occupational prestige and lower incidences of

unemployment, participants in skilled or semi skilled manual training are sometimes found to have a higher probability of experiencing unemployment than are individuals receiving no formal training beyond formal education (Mangum and Adams, 1987). These may reflect seasonality or the recent displacement sensitivity of such jobs. Conversely, those studies that have sought to look at the duration of the earnings impacts associated with participation in post school occupational training, suggest impacts lasting 11 to 12 years for professional, technical, and managerial training, 15 years for skilled manual training, and about 7 years for clerical and other training (Lillard and Tan, 1986).

Some attention has been given in the literature to the possible influence of firm size on the magnitude of the wage effects associated with participation in training. Among the theoretical justifications for such investigation is the assumption that differences in employee monitoring costs will motivate larger firms to hire a higher quality workforce on average than will small firms, or the assumption that large firms engage in more firm specific training than do smaller firms. Both assumptions have implications for differences in wages by firm size. A number of studies have found wage growth to be higher in small firms than in larger firms (Barron, Black and Loewenstein, 1987; Schiller, 1982). Recent work, using data from the Survey of Income and Program Participation, finds wage growth to be higher in large firms but suggests that when differences in personal characteristics are controlled, workers in large and small firms experience near identical rates of wage growth (Haber and Lamas, 1988; Keeley, 1984).

Underinvestment?

A number of arguments have been advanced suggesting that employers and workers may invest in an amount of training that is less than optimal from a societal perspective. Some of the arguments supporting this view are conveniently summarized in Bishop et al. 1985:

a. Since some portion of most on the job training is portable to multiple work settings, employers may be discouraged from heavy investment in the skills of the individual due to the risk of lost investment.

b. Wage regulations such as minimum wage laws may prevent employers from downwardly adjusting training wages sufficiently to capture the costs of investment in people. In the absence of such flexibility, employer willingness to invest in OJT may be diminished (Hashimoto, 1982).

c. Because employers have difficulty properly evaluating the quality of OJT received on previous jobs, workers may tend to be less than fully compensated or on the job training received in previous employment. This may discourage employee investment in on the job training.

d. Capital market barriers to borrowing for human capital investment in general and OJT investment in particular may constrain such investment overall.

e. Since individuals and firms undertake human capital investment based upon their implicit individual calculations of the associated benefits and costs, these decisions may occur without factoring in external benefits that accrue to society as a whole. The

underinvestment argument suggests that for these reasons less than desirable quantities of human capital investment (such as OJT) may be produced in the absence of public policies to subsidize the activity.

VI. What are the Productivity Impacts of Private Sector Training?

Literature on the productivity impacts of participation in training is scarce. The collection of such data through employer survey is difficult, both in terms of operationally collecting meaningful data and because firms are often protective of such information. Further, until only recently most investigations of the returns to training have accepted the economic assumption that productivity increases due to training are reflected in the market wage rates commanded by those receiving training, and that wage effects are consequently a reasonable proxy for productivity effects (Medoff and Abraham, 1981).

Work by John Bishop and others, based on a data set drawn from telephone interviews with over 3800 employers nationwide for the National Center for Research in Vocational Education, is the source of most of our understanding on this topic. Bishop finds that wage rate growth due to training is much smaller than productivity growth due to training. Bishop estimates that on average, and cutting across all reported on the job training, one hundred additional hours of on the job training increases productivity by 10 to 20 percent, whereas the impact on observed wages is 2 to 6 percent. Bishop suggests that about one third of productivity growth occurs in the first three months on the job. In low skill jobs, productivity growth occurs at a slower rate than this beyond the first three months, while in high skill jobs the

rate of productivity growth increases after the first three months. Bishop documents some interesting differences in productivity growth by firm size. In addition to finding a positive association between productivity growth and firm size, he ranks different training techniques on the basis of the rate of return in terms of productivity growth. He finds that in small firms (100 employees or less) informal on the job training by other employees offers the highest rate of return, followed by informally watching others, informal on the job training by management, and finally, formal training by management. Interestingly, the order is reversed in the case of larger firms (Bishop, et al., 1985).

VII. Policy Issues and Options

The mass production world of industrial society required a relatively small number of workers with the theoretical tools acquired in post high school training. In the plant, apprenticeship provided the broad training needed in the crafts and in maintenance. Beyond, the need was for semi skilled operatives trained on the job for immediate tasks and to meet the incremental demands imposed by technology. The workplace was hierarchial and fractionalized. Detailed rules were imposed by management and collective bargaining protected the workers from arbitrary application of managerial rights. In the event technological change was more than incremental in nature, retraining was the norm in unionized settings while rehiring was the norm in non-union settings.

Public policy supported the system through the provision of retraining. The Manpower Development and Training Act of 1962 is perhaps a best example. Experience with the persistently unemployed soon taught, however, that those to be served needed remedial education in the classroom. Remedial education was needed not in order to do the job but in order to take the training needed for the job. Remedial basic education became institutionalized in the second chance programs of the late 60s, 70s and the 80s (Mangum, 1969; Mangum and Walsh, 1973; Levitan and Mangum, 1981).

Today, we are rapidly moving through the post industrial or information age. Forces of international competition have increased the demand for information technologies which in turn have tended to replace the demand for economies of scale that characterized the industrial age. Information technology is unique from the technology of the industrial age in two significant ways. First, it requires a different mix of and a more advanced level of basic employability skills than those needed in the industrial age (Carnevale, Gainer, and Meltzer, 1989). As a result, the workplace is now demanding a higher entrance level of employability skills than the schools have historically been asked to provide. Demographics have further clouded the horizon. Our population is aging and our labor force is becoming more minority and female dependent.

Second, information technology cannot easily be produced by standardized means. It is more fluid and more quickly evolving. Such technology must be developed and marketed rapidly if economic rents from comparative advantage are to be exploited. In an international economy characterized by rapid diffusion of information across the globe,

comparative advantage disappears more quickly today than in times past. As a result, leading edge technology is increasingly developed in the workplace.

Employers have responded to these trends in a number of ways. First, business has complained about the schools and their seeming inability to deliver the product. Second, some firms have pursued cooperative efforts to assist and support the schools. "Support a school" programs and competency programs are examples (Committee for Economic Development, 1987). Third, employers have instituted in house programs of workplace literacy to supplement the schools in providing the basic employability skills that are the foundation of the higher order skills required by the information age (Rosow and Zager, 1988). Finally, firms are increasingly becoming learning institutions. They spend billions on training; a number of companies offer college degrees from their in house programs.

Movement into the information age requires a reassessment of the responsibilities and roles of individual, school, employer, and government as these responsibilities and roles relate to human resource development. <u>While such a reassessment is beyond the scope of this particular paper; a call for such a reassessment is not.</u> As presented in greater detail above, the directions of change in employability and skill requirements is very clear. An information society is more reliant on human capital than was either the agrarian or industrial societies that preceded it. What is unclear as we look ahead is the pace and volume of change that will occur. Experience has shown us that there is a tendency to overestimate the pace at which such changes

emerge. Careful, precise research is needed to document the pace at which the forecasted changes are occurring in our world of work. Since it is probable that the pace and volume of change are not of the crisis proportions that some would suggest, what are needed are well conceived long run policies to address the issues as opposed to policies bred from a sense of crisis. It is within the mandate of the Commission on Workforce Quality and Labor Market Efficiency and similar efforts, to push toward a synthesis of findings and the emergence of a coordinated plan of action.

It is in this context that the following policy issues are presented. The focus is on issues of supporting and extending efforts in private sector training that seek to improve this nation's ability to act and to compete in the information age. The issues presented flow from the literature reviewed in this paper. The options are those conceivable but do not necessarily reflect the literature reviewed here. The policy options presented are just that; they are only options. Recommendations can emerge only after detailed analysis of experience in these areas and exploration of the likely impacts of policy movement in these alternative directions.

Issue #1. The Extent of Private Sector Training

We know surprisingly little about private sector training, particularly about employer provided training, and most specifically about informal on the job training. Estimates of employers' annual expenditures on training are of questionable accuracy given the looseness of the methodologies from which these estimates have been

derived. Most of our knowledge of private sector training comes from asking individuals about the extent and nature of any qualifying and upgrading training in which they may have participated. Precious little of our understanding is derived from information received from employers. Even given access to employers, on the job training, and particularly the informal variety, is difficult to measure with precision.

Private sector training may be of sufficient policy importance today to justify initiation of a systematic data collection effort. A key question is whether that interest will continue in the future. To the extent that data collection from employers is warranted, the survey instrument developed by John Bishop and others at the National Center for Research in Vocational Education for their 1984-85 employer survey should serve as a departure point. It is composed of the type of questions needed to obtain measurement of the extent, cost, and productivity impacts of employer provided training. The survey and the sampling design would need to be expanded to yield a more representative look at all types of employer provided training.

Issue #2. Access to Training

The findings reviewed here suggest that continued efforts should be made to "understand the private market processes which generate the bulk of the economy's training opportunities and with which the government must coordinate" (Parsons, p. 187). It should always be remembered that jobs create training opportunities; training does not create jobs (Seninger, 1988).

That females and minorities are significantly less likely to receive post-school forms of education and training than are white males, that this is particularly true of company provided training which typically offers very sizeable rates of return, and that these differences have held up under sophisticated econometric controls for selection bias, suggests that continued effort to understand forces behind racial and gender differences in training participation is warranted. An apparent key in this investigation is gaining an understanding of the complex reasons behind racial differences in educational attainment and achievement early in the lifecycle and the link between these differences and post-school investment decisions by individuals and employers.

Among the policies that may improve access to private sector training are:

i. Efforts to keep young people in school, particularly those with significant "at risk" characteristics (Committee on Economic Development, 1987).

ii. Continued enforcement of Affirmative Action laws and active promotion at the organization level of efforts to improve the representation of minority groups in positions receiving significant amounts of training.

iii. Continued support and development of a viable second chance skill development system that a. assists those who fail in or who are failed by the mainstream education system by preserving individual access to and incentives for participation in quality skill development activities (Berlin and Sum, 1988) and b. which targets such assistance

on the truly disadvantaged (Levitan and Gallo, 1988). The literature reviewed here raises the possibility (still needing further investigation) that the private training market, when left to itself, acts to reinforce rather than erase economic and social inequalities that emerge early in the lifecycle.

While some improvement in access to training for all groups in our society should occur naturally as market mechanisms respond over time to the increased presence of minorities and women in the labor force, our ability to compete in a global economy and respond to today's challenges may be increased by proactive efforts in these areas.

Issue #3. Underinvestment in Training

The popular press seems replete with calls for renewed emphasis on human capital investment. As one example, BusinessWeek entitled its September 19, 1988 issue "Needed: Human Capital." This report concludes that "investments in education and training will yield sure fire returns we can't afford to ignore." The calls have found political footholds. President Bush reflects this emphasis in his desire to be "the education President." Curiously however, the available rate of return literature does not generally document rates of return to all forms of post-school occupational training that seem tremendously above normal. For example and as cited earlier, Lillard and Tan document rates of return in the five to nine percent range. While rates of return do seem above normal in some cases, such as in some studies of employer provided training, the picture is less than clear. However, in reviewing the rate of return literature it must be remembered that there

are a number of theoretical arguments (see Section V of this report) which lend support to the underinvestment hypothesis by suggesting that employers and workers invest in an amount of on the job training that is less than optimal from a societal perspective. These arguments suggest that social rates of return to different types of human capital investment may deviate significantly from private rates of return.

Additional research in this area is warranted. Much of the rate of return literature cited in this report is somewhat dated at this point. Private rates of return may have increased in recent years. Further, many of the studies reviewed report earnings impacts instead of rates of return. For both reasons careful documentation of current rates of return to different forms of private sector human capital investment are currently warranted. Beyond this, careful investigation of the validity of the underinvestment arguments is needed in attempt to document the relevant social rates of return to the different forms of private sector human capital investment.

To the extent that underinvestment in private sector training is shown to exist, the following are some possible options for increasing the extent of such training that are worthy of additional policy research.

1. Increasing the rate of return to employer provided training by lowering turnover in jobs offering quality on the job training through:

i. Education of young jobseekers to factor issues such as access to training opportunities into their job search. This might involve providing career counselors with information on the training reputations

of local firms and age earning profiles of various careers, in addition to information on starting salaries.

ii. Education of firms to recognize the costs involved in providing quality on the job training thereby providing firms with incentives to invest in improved hiring selection techniques that will result in improved job matches and lower turnover.

2. Promoting certification of employer provided training in order to document the quality of such training and improve the market's ability to value on the job training. Some strategies consistent with this objective would be:

i. Encouragement of firms to certify competencies learned in firm-provided on the job training programs so as to increase the visibility of and commitment to training within the firm and to facilitate skill documentation across firms.

ii. Exploration of the feasibility of industry wide competency standards as a prelude to industry wide skill certification systems.

3. Investigating the subsidization of employer provided formal training through tax credits based on measures such as qualified increases in employer training expenditures. Questioning of much of firm provided on the job training is portable from employer to employer raises concerns about using this strategy to encourage the training of young workers. Additionally, the difficulties in measuring informal training suggest it would be even more problematic to subsidize.

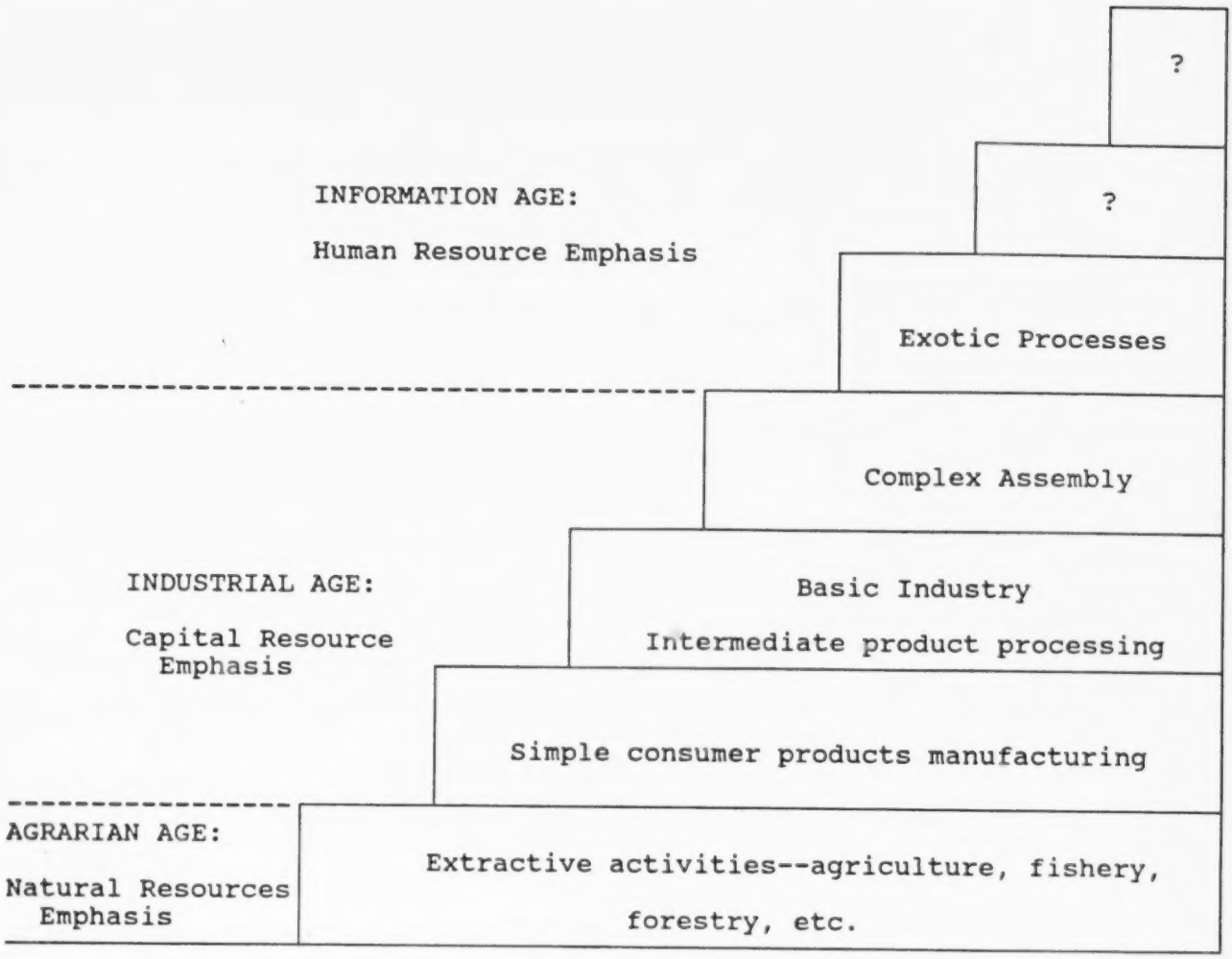

Figure 1: Stages in Economic Development

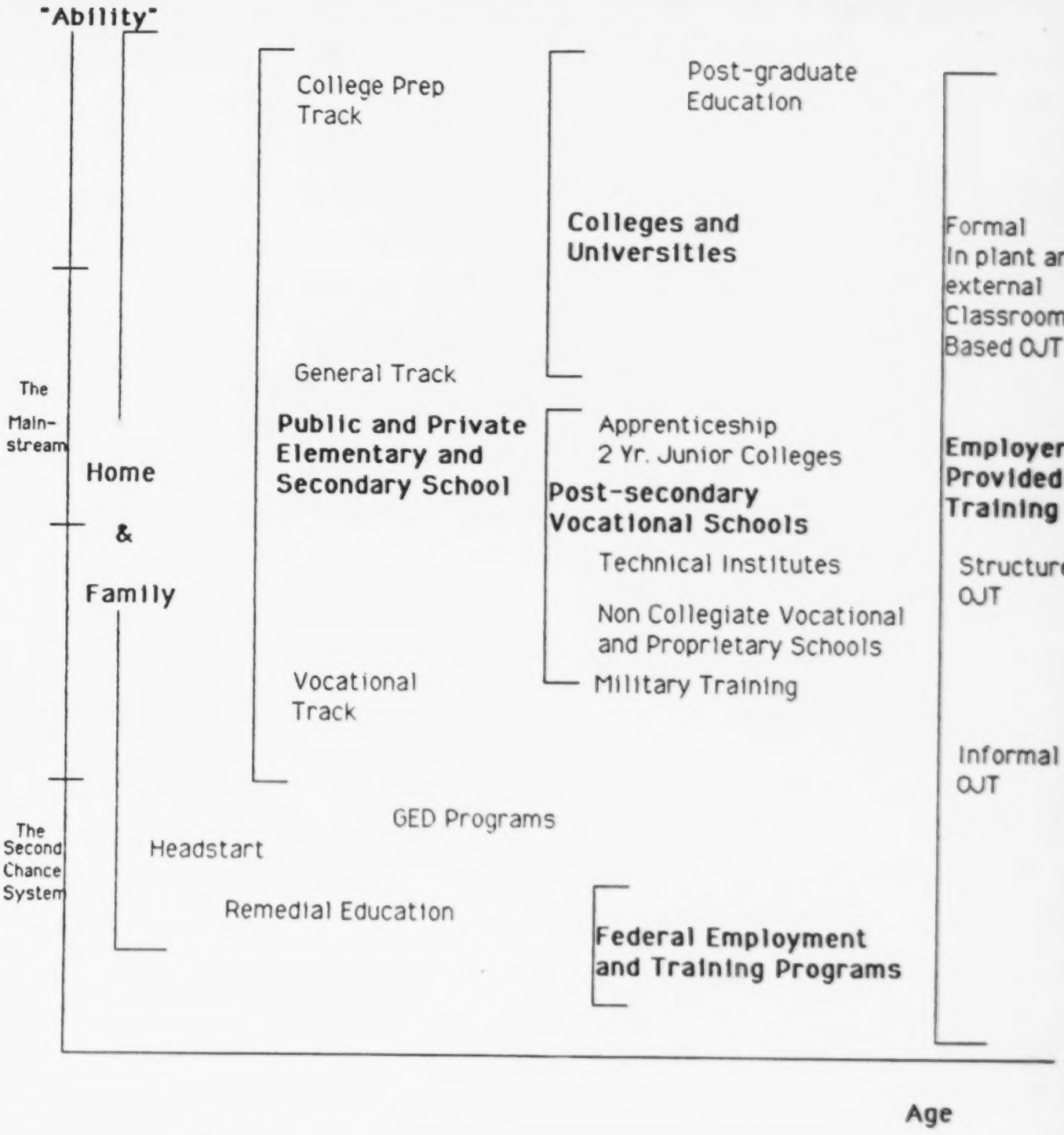

Figure 2: Institutions of Employability Development

Table 1
The American Education and Training System: An Overview

	Expenditures	Enrollment
Public/Private Elementary and Secondary Education	161 billion	46 million
Federal Program Funding:		
Head Start	1.25 billion	447,000
Compensatory Education	4.57 billion	5.2 million
Handicapped	2.00 billion	4.5 million
Vocational Education	918 million	NA
Native American	340 million	284,000
Bilingual Education	197 million	230,000
Post-Secondary		
Universities and Colleges	105 billion	12.4 million
Apprenticeships	NA	4-600,000
Military	17.6 billion	
Veterans Programs	598 million	NA
JTPA	3.7 billion	2.1 million
Vocational Rehabilitation	1.7 billion	924,000
Adult Education		
Federal appropriations	162 million	
State appropriations	175 million	
Federal Program Funding:		
Pell Grants	4.5 billion	2.9 million
Guaranteed Student Loans	3.2 billion	3.5 million
College Work Study	610 million	753,000
Supplemental Educational Opportunity grants	438 million	720,000
Trio programs	219 million	525,000
Perkins loans	205 million	880,000

Sources: All data for 1985-1986. U.S. Department of Commerce, Statistical Abstract of the United States 1988, U.S. Government Printing Office, 1987; Sar A. Levitan and Frank Gallo, "Uncle Sam's Helping Hand: Educating, Training and Employing the Disadvantaged," in New Developments in Worker Training: A Legacy for the 1990s, Industrial Relations Research Association, forthcoming; Department of Defense, Military Manpower Training Report FY1989, Washington D.C., 1988; U.S. Department of Labor, Bureau of Apprenticeship Training, Apprenticeship: Past and Present, U.S. Government Printing Office, 1987; U.S. Department of Labor, Occupational Projections and Training Data, U.S. Government Printing Office, 1986.

Table 2
Sources of Employer Purchased Formal Training
(Percentages)

Schools	63.5
Four year colleges and universities	34.9
Elementary and high schools	1.0
Two year colleges and technical institutes	18.6
Vocational and trade schools	6.8
Other	2.1
Nonschools	36.5
Government	4.4
Professional associations and labor organizations	12.6
Tutors	3.8
Business firms	14.0
Community Organizations	1.6

Source: Anthony Carnevale, "The Learning Enterprise," Training and Development Journal, Volume 40, Number 1, 1986.

Table 3
Formal Training Purchased by Adult Workers, 1985

Provider	Share of Purchased Training	Dollar Value
Schools	(56.4)	5,245 million
Elementary and secondary	1.5	139.5 million
Community colleges and technical institutes	15.5	1,441.5 million
Colleges and universities	31.2	2,901.6 million
Vocational schools	7.0	651.0 million
Other schools	1.2	111.6 million
Professional, trade, and labor organizations	14.2	1,320.0 million
Training industry	15.7	1,460.0 million
Community organizations	3.2	297.6 million
Tutors and private instructors	1.2	111.6 million
Government	5.6	520.0 million
Other	3.5	325.5 million

Source: U.S. Census Bureau, Survey of Participation in Adult Education, Washington, D.C.: U.S. Government Printing Office, 1987, as reported in Carnevale, Anthony P. and Gainer, Leila J., "The Learning Enterprise," American Society for Training and Development and The U.S. Department of Labor, draft manuscript, October 1988.

Table 4
Sources of Training Reported by American Workers

Source of Qualifying Training	Number Identifying Source (millions)	Percent Identifying Source (a)	Percent Identifying Source (b)
School	28.1	52.1	28.9
Formal Company Programs	9.4	17.4	9.7
Informal On the Job Training	27.0	50.0	27.7
Armed Forces	1.9	3.5	2.0
Correspondence Courses	.8	1.5	1.0
Friend or Relative	3.2	5.9	3.3
Source of Upgrading Training			
School	11.4	33.6	11.7
Formal Company Program	10.6	31.3	10.9
Informal On the Job Training	13.6	40.2	14.0
Other	4.3	1.3	.4

Source: Carey, Max, U.S. Department of Labor, How Workers Get Their Training, Washington D.C.: U.S. Government printing Office, 1985.
(a) value in first column as percent of total number of workers reporting needing some training for their job (53.9 million).
(b) value in first column as percent of all employed workers in survey (97.3 million).

Table 5
Employer Provided Training by Employee Classification

Classification	Average Percent Distribution of HRD Budget	Average Hours of Formal Training Per Year
Executive	12.2	36.3
Senior Management	NA	33.6
Middle Level Management	22.4	36.6
Professional	NA	35.8
First Line Supervisory	21.8	33.3
Sales	15.9	42.6
Administrative	NA	21.8
Customer Service	NA	26.8
Production	NA	29.1
Clerical	6.0	16.9
Technical	18.5	NA
Other (safety, hourly)	3.0	NA

NA: category not included in survey. Source: Lee, C., "Where the Training Dollars Go," Training, Volume 24, October 1987; Stephan, E., et al., "HRD in the Fortune 500," Training and Development Journal, Volume 42, January 1988.

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